

PATENT SPECIFICATION

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DRAWINGS ATTACHED



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(54) IMPROVEMENTS IN OR RELATING TO SWITCHING SYSTEMS FOR TOW TRUCK CONVEYOR SYSTEMS

(71) We, AMERICAN CHAIN & CABLE COMPANY, INC., a Corporation organised and existing under the laws of the State of New York, United States of America, of 230, Park Avenue, New York, State of New York, United States of America, (assignee of KARL R. M. KARLSTROM), do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to switching systems for tow truck conveyor systems.

It is common to provide a conveyor system with tow trucks that have tow pins that extend into slots which define the track in the floor, into engagement with a chain beneath the floor to pull the tow trucks along the floor. In the handling of such tow trucks, it is also common to have branch track portions and switch tongues for diverting the tow trucks to a branch track portion.

According to the present invention a switching system for selectively diverting a truck from a main track portion to a branch track portion of a tow truck conveyor system, comprises switch means adapted to be arranged in the region of the juncture of a main track portion and a branch track portion and movable from a straight-ahead position to a position for diverting a truck from the main track portion to the branch portion, latch means for holding said switch means in one of its two positions, a signal reader element movable into and out of the path of a truck approaching the juncture and connected to said latch means by a flexible element, means adapted to be arranged in the path of a truck and adapted to be operated by the approach of a truck to apply tension to said flexible element to move said reader element into the path of the truck, and signal means adapted to be arranged on a truck and to be pre-positioned to engage said signal reader element when the truck approaches the juncture to apply further tension to said flexible element to

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disengage said latch means from said switch means and permit said switch means to move to its other position.

The present invention will now be further described, by way of example, with reference to the accompanying drawings in which:—

Figure 1 is a fragmentary plan view of a system embodying the invention.

Figure 2 is a fragmentary view similar to Figure 1 of a modified system showing the parts in a different position.

Figure 3 is a fragmentary vertical view through a portion of the system.

Figure 4 is a view similar to Figure 1 on an enlarged scale with parts broken away.

Figure 5 is a fragmentary sectional view on an enlarged scale taken along the line 5—5 in Figure 4.

Figure 6 is a fragmentary sectional view on an enlarged scale taken along the line 6—6 in Figure 4.

Figure 7 is a fragmentary sectional view taken along the line 7—7 in Figure 4.

Referring to Figure 1, the system embodying the invention comprises a floor 10 having a slot 11 therein which defines a main track and a slot 12 intersecting the slot 11 and defining a branch track. A plurality of carriers in the form of tow trucks 13 having wheels 14 (Figure 3) are provided. Each tow truck 13 includes a tow pin 15 extending downwardly through the slot 11 into engagement with a trolley or pusher 16 that is fixed to a chain 17 driven in a manner not shown.

At the area of juncture of the main track 11 and branch track 12 a switch tongue 18 is provided. As shown in Figures 4 and 7, the switch tongue 18 is mounted on a tube 19 which is telescoped over a fixed shaft 20 that extends between a floor plate 10a and a frame or housing 21. A latch lever 22 is also fixed to the tube 19.

The tongue 18 includes one part 18a in the region of the juncture between the slot 12 defining the branch track and the slot 11 defining the main track, and a re-setting

portion 18b only in the region of the slot 12. When the portion 18a does not project across the main track slot 11 as shown in Figures 2 and 4, pin 15 of a trolley 16 will not be diverted into the branch track slot 12, but when the portion 18a extends across the main track slot 11 as shown in Figure 1, portion 18b projects across the branch track slot 12. Pin 15 of a trolley 16 will be diverted from the main track slot 11 into the branch track slot 12 by the portion 18a, and during subsequent movement down the branch track slot 11 will engage the portion 18b and return the switch tongue 18 to its normal position as shown in Figures 2 and 4.

Latch lever 22 is yieldingly urged in a direction tending to move the switch tongue into position where it will divert a tow pin 15 by a spring 23 that is fixed at one end to the latch lever 22 and at the other end to a support 24 fastened to the housing 21. The switch tongue 18 is normally held out of the position wherein it would divert the tow pin of a tow truck by a plurality of latches 25 which are pivoted on a shaft 26 that is fixed to the housing 21 and extends vertically. Each latch 25 includes a notch 26 that engages a roller 27 on the latch lever 22. The rollers 27 are rotatably mounted on a pin 28 that extends vertically upwardly from the latch lever 22 (Figure 7). Each latch 25 is urged against its respective roller 27 of the latch lever 22 by a spring 25a which is connected at one end to the latch 25 and at the other end to the housing 21.

Referring to Figures 2, 4 and 5, each latch 25 has a signal reader element 29 associated therewith. Each signal reader element is pivoted to a bracket 30 fixed to housing 21 and is adapted to swing upwardly and rearwardly to the broken line position shown in Figure 5 through an opening 32 in the floor plate 10a into the path of a signal member 33 on the tow truck. Each signal reader element 29 is urged toward a position downwardly and forwardly within the floor by a tension spring 34 that is fixed at one end to the signal reader element 29 and at the other end to a bracket 35 on housing 21. A cable C is fixed at one end to each latch 25 by a lever 36 and at the other end to its respective signal reader element 29 as at 37. Each cable C is trained over a pair of pulleys 38, 39 mounted on brackets 40, 41 fixed to the frame 21 for rotation about vertical axes. Each cable C is further trained over a pulley 42 rotatably mounted on a bracket 43. A spring 36a has one end thereof connected to lever 36 and the other end thereof connected to housing 21 to take up any slack in cable C.

As shown in Figures 4 and 6, all of the pulleys 38 are mounted on the single bracket 40. In the same manner, all of the pulleys 39

are mounted on the single bracket 41. As shown in Figures 1 and 4, two signal reader elements 29 are provided in side by side relation in two of a plurality of positions P shown in broken lines in Figure 1.

In order to elevate the signal reader elements 29 into the path of the tow truck when it approaches the area of juncture of the main track and branch track, a conditioning lever 44 is pivoted about a vertical axis on a pin 45 and extends in the direction of travel of the tow trucks for swinging movement into and out of the path of the tow pin as it moves in the slot 11. An idler pulley 45a for each cable C is mounted on a bracket 46 on lever 44. The reach R of each cable C between its pulleys 38, 39 extends adjacent its respective pulley 45a.

Lever 44 is normally in the path of the tow pins 15. As a tow truck approaches the its tow pin 15 engages the lever 44, the lever is swung laterally, or downwardly as viewed in Figure 4, bringing pulleys 45a into contact with the cables and applying tension to the cables to elevate the signal reader elements 29 to the broken line position shown in Figure 5. As the tow truck is moved further along the slot, if the signal reader elements 33 are properly positioned and correspond in position to the position of the signal elements 33 on the tow truck, the signal reader elements 29 will be engaged and swung downwardly and forwardly. This movement of signal reader elements 29 applies tension to the cables C to pull the latch elements 25 out of engagement with the rollers 27 on latch lever 22 releasing the latch lever 22 to permit the spring 23 to swing the switch tongue 18 into the path of the tow pin and thereby divert the tow truck (Figure 1). If the signal elements 33 on the tow truck are not positioned properly, for example, if only one of a plurality of signal reader elements are engaged or none is engaged, at least one of the latches 25 will remain in engagement with the latch lever 22 so that the switch tongue will not be actuated.

In order to prevent diverting the tow truck into a branch slot 12 which already has a carrier therealong, a choke system is provided which includes a choke latch 50 pivoted on the shaft 26 and having a notch therein engaging one of the rollers 27 on latch lever 22. The choke latch 50 is normally held out of engagement with its respective roller by a spring 51 operating through a lever 52. However, if a tow truck is present in the branch slot 12, its tow pin will engage a lever 55 in the slot 12 applying tension to a cable 53 trained over a pulley 54 to urge the choke lever 50 into engagement with the latch lever 22 thereby preventing the latch lever 22 from moving and, in turn,

the switch tongue from moving to the diverting position.

In the form of the invention shown in Figure 2, two additional signal reader elements 29¹ are provided on the other side of the slot 11 and latches 25, pulleys and cables are associated with them. This permits a greater combination of signal settings of the signal elements 33 on the tow truck.

Although the system has been described in connection with a subfloor conveyor system, it is also applicable to overhead power and free conveyor systems comprising main and branch tracks with an associated switch tongue.

WHAT WE CLAIM IS:—

1. A switching system for selectively diverting a truck from a main track portion to a branch track portion of a tow truck conveyor system, comprising switch means adapted to be arranged in the region of the juncture of a main track portion and a branch track portion and movable from a straight-ahead position to a position for diverting a truck from the main track portion to the branch track portion, latch means for holding said switch means in one of its two positions, a signal reader element movable into and out of the path of a truck approaching the juncture and connected to said latch means by a flexible element, means adapted to be arranged in the path of a truck and adapted to be operated by the approach of a truck to apply tension to said flexible element to move said signal reader element into the path of the truck, and signal means adapted to be arranged on a truck and to be prepositioned to engage said signal reader element when the truck approaches the juncture to apply further tension to said flexible element to disengage said latch means from said switch means and permit said switch means to move to its other position.

2. A system as claimed in claim 1, in which said signal reader element is movable in such a manner that it swings out and rearwardly into the path of a truck and in and forwardly out of the path of a truck.

3. A system as claimed in claim 1, or claim 2, including a plurality of said signal reader elements and a flexible element and latch means individual to each said reader element.

4. A system as claimed in any one of claims 1 to 3, in which said means in the path of a truck and operable to apply tension to said flexible element comprises a member pivoted adjacent the path and normally in the path of a tow pin of a truck.

5. A system as claimed in claim 4, in

which said flexible element has a reach thereof extending across a pair of pulleys, said flexible element tensioning means having a pulley engaging said reach to apply said tension to said flexible element upon movement of said tensioning means.

6. A system as claimed in any one of claims 1 to 5, including a choke element operable upon said switch means and adapted to be engaged by a tow pin of a truck along said branch track portion to prevent movement of said switch means on disengagement of said latch means.

7. A system as claimed in any one of claims 1 to 6, including means yieldingly urging said signal reader element in a direction out of the path of a truck.

8. A system as claimed in any one of claims 1 to 7, including means yieldingly urging said latch means into engagement with said switch means.

9. A system as claimed in any one of claims 1 to 8, in which said switch means comprises a switch tongue pivotally mounted adjacent the area of juncture of said main track portion and branch track portion, said latch means including latch elements pivoted adjacent said switch tongue and engaging a latch lever connected to said switch tongue, and spring means yieldingly urging said switch tongue in one of said positions to hold said latch means in engagement with said latch lever.

10. A system as claimed in any one of claims 1 to 9, adapted to be positioned beneath a floor in which the main and branch tracks are defined by slots and a drive chain of the conveyor system is also below the floor.

11. A system as claimed in any one of claims 1 to 10, including a plurality of said signal reader elements in laterally disposed relation adjacent the path of a truck, a flexible element and latch means individual to each said signal reader element.

12. A system as claimed in claim 11, in which at least one of said signal reader elements is on an opposite side of said main track portion.

13. A switching system for a tow truck conveyor system constructed and arranged and adapted to be used substantially as hereinbefore particularly described with reference to and as illustrated in Figures 1 and 3 to 7 or in Figure 2 of the accompanying drawings.

14. A switching system as claimed in claim 13 whenever embodied in a tow truck conveyor system.

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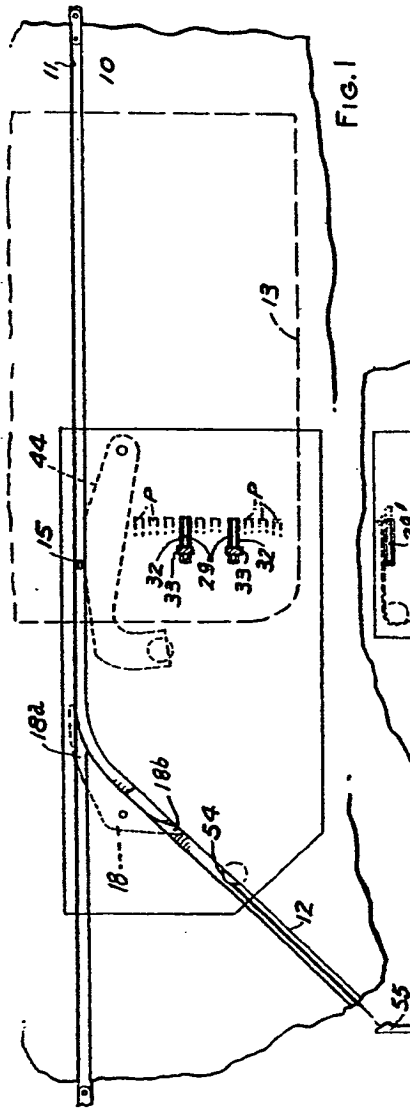


FIG. 1

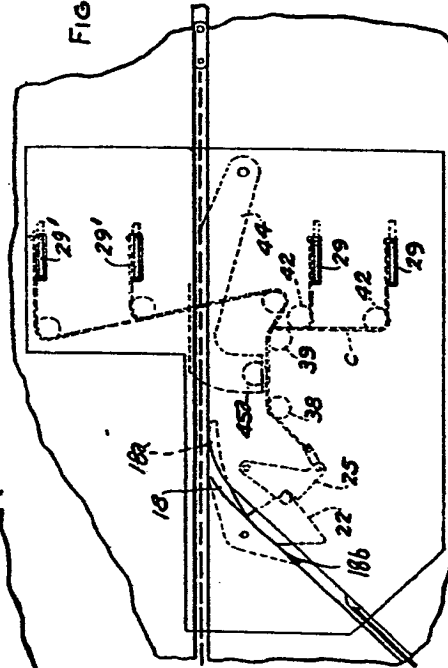


FIG. 2

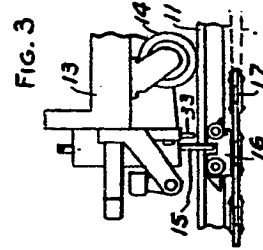
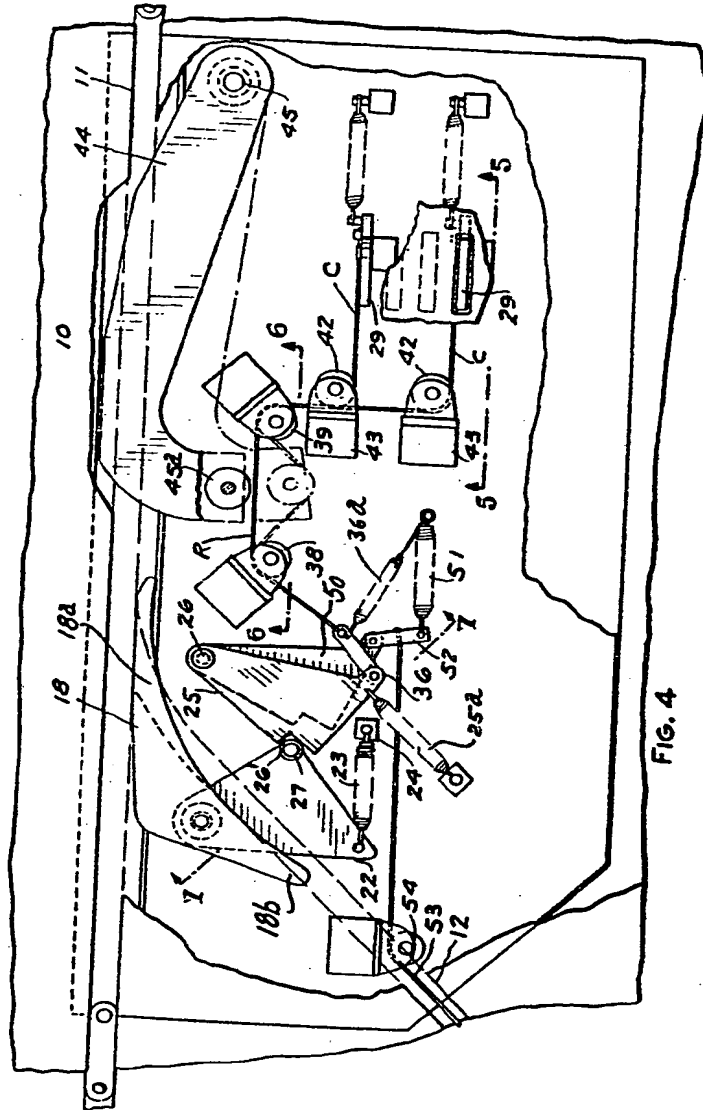


FIG. 3

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3 SHEETS

COMPLETE SPECIFICATION
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the Original on a reduced scale
Sheet 2



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